Remarks/Arguments

Item 4:

Claim 1

Claim 1 stands rejected as being obvious in light of Giancaterini (U.S. Pat. No. 4,590,092) in view of Datta et al. (U.S. Pat. No. 5,370,952). Applicants disagree with the rejection in light of the improper conclusion drawn from the teachings in '952 which was principally used to reject Claim 1.

It was stated in the Office Action, in support of the rejection, that '952 teaches "removing the organic materials from the inner surface of the faceplate panel by volatizing the organic materials through heating, which diffuse through holes in the aluminum layer faster than the gaseous decomposition products evolved (otherwise, blisters would form)." Applicants point out that there is no support for this assertion that diffusion through holes must be greater than the evolution of gaseous decomposition products, because this analysis ignores the fact that each individual gaseous decomposition products do not have to immediately diffuse through holes in the aluminum layer to prevent blister. The reason is that it is well known that all gaseous species physisorb to solids and some both chemisorb and physisorb to solids, especially if the species are large. As such, the gaseous species can seep through holes in the aluminum in a delayed manner and do not necessarily have to nucleate to form bubbles which would rupture or blister the aluminum. The case of materials underneath the aluminum film in a CRT, there is plenty of surface area both on the aluminum film and the other components (i.e., phosphor, glass, graphite, other organic materials) which can inhibit the formation of pockets of gas bubbles when the gaseous products are evolved, because the specific gaseous products can certainly generate faster than they can diffuse through the aluminum without blistering or rupturing the aluminum,

especially those types of species which may have a low overall mass. Additionally it should be pointed out that the aluminum film can move slightly without blistering, meaning that it should be able to accommodate some expansion of gases prior to diffusion, because it is a thin continuous metal film which sits on layers of materials that are to be expelled. (If the aluminum films were to lack some resiliency, the baking of the materials under them would never be feasible, because otherwise the aluminum film would rupture as it descends as the layers of materials thereunder bakeout.) Further, '092 does not teach nor suggest anything about diffusion rates. The examiner concludes from reading '092 that the diffusion rate must be greater than the generation of gaseous species. But this is not necessarily true. This logic ignores the situations were there are for species having minor levels of gaseous molecules generated, such as in Applicants' case. When there are minor levels of a gaseous species generated, the rate of the diffusion clearly does not have to be greater than the rate of gaseous species evolution because the volume generated would simply not be so great. The cited reference simply does recognize or teach having the diffusion rate for each component being greater than the volume rate of the production of each component. Applicants' invention of claim 1 ensures that blistering does not occur by acknowledging a diffusion rate of each component as the criteria for baking out materials and establishing that each component is baked at a rate where the diffusion rate is greater than the volume rate. The cited reference '092 only teaches how to increase the venting the gaseous species through the aluminum by the improved method for the application of microcrystals. The cited reference does not suggest the tailoring of thermal cycles during the baking process to control gas liberation rates. If anything, '092 teaches one skilled in the art to adjust materials and the treatment of materials prior to aluminization (see col. 3, lines 26-29 in '092) to control blistering.

In the office action, claim 1 was found to be unpatentable based on '092 in view of '952, on the theory that electrophotographic screening is a conventional manufacturing process and as such, can be selected for use in '092. Applicants disagree with this conclusion, because if one were to combine the teachings in '092 and '952 one would not come up with Applicants' claimed invention. The reference '092 does not teach tailoring a screen baking thermal profile to ensure that the diffusion rate for each component exceeds the volume rate for the components. Rather what '092 teaches is the improved process of selecting and applying microcrystal to prevent blister. It does not teach changing any thermal screen bake profile. Hence, if one were to consider using the electrophotographic screening process (EPS) in '952 and consider using the teaching in '092 to effectively screen bake the electrophotographic screen, one skilled in the art would find that '952 suggests that screen bake can be successfully performed by appropriately tailoring the composition and application treatment of the microcrystals. (See col. 3, lines 14-21 in '092.) There is simply no teaching nor suggestion to tailor the heating cycle of screen baking to ensure that the diffusion rate for each gaseous decomposition product is greater than the volume rate for each gaseous decomposition product.

Further in support of the rejection to claim 1 it was asserted that a prima facie case of obviousness is supported by *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327 (1945). In that case, a patent was invalidated because the court found that one who merely selects "a known compound to meet known requirements is no more ingenious than selecting the last piece to put into the last opening in a jig-saw puzzle." (325 U.S. 327, 335) Applicants fail to see what the "known" component is in '092 that can be placed into '952 to support invalidity of claim 1 or what the "known" component is in '952 that can be placed into '092 to support invalidity of claim 1. Cited

reference '952 teaches EPS screening and also suggests baking up to a temperature of 425 degrees C (in claim 2). Cited reference '092 teaches using of microcrystals, drying microcrystal to roughen the surface of the organic layer to avoid aluminum blisters during cap bake and shows the heating of material up to 450 degrees C. None of these references suggests the individual tailoring of the thermal cycles during screen bake such that the volume rate of each gaseous product is less than the diffusion rate of each gaseous product. '092 does not teach controling any volume rate generation of the gaseous species, but rather teaches controlling blister formation by using improved microcrystals and improved microcrystal application techniques. Cited reference '092 does state that "blister formation being directly proportional to the speed of decomposition or evaporation," but this reference does not teach nor suggest controlling the rate of decomposition or evaporation through screen bake thermal cycling. Rather, '092 teaches away from controlling blister by adjusting thermal cycles by teaching the use of improved microcrystal and microcrystal treatment.

Claim 3:

Applicants also assert that the rejection of claim 3 should be removed, on the grounds that the base claim 1 is in condition for allowance. Applicants also point out that the key consideration in understanding the feature of the claimed invention in claim 3 is that claim 3 teaches the use of a plurality of rates of temperature increase: there should be a tailored rate for each component. None of the cited references suggests this feature.

Claim 11:

Applicants also assert that the rejection of claim 11 is improper. In the Office Action, it is suggested that because (1) '092 mentions heating "higher than 350 °C to volatilize the organic components (col. 3, lines 14-17)" and (2) that the various screen

components must have individual beginning decomposition temperature, claim 11 is invalid. The cited references do not teach in combination nor individually the use of a plurality of temperature rate increases for each of the components, where rates each create gaseous decomposition products at volume rates less than diffusion rates.

Item 5:

Claim 2

Claim 2 stands rejected as being obvious in light of Giancaterini (U.S. Pat. No. 4,590,092) in view of Datta et al. (U.S. Pat. No. 5,370,952) and in further view of Saulnier (U.S. Pat. No. 3,067,055, '055) and Ehemann (U.S. Pat. No. 5,619,330, '330).

Applicants first note that claim 2 depends from claim 1. As such, Applicants request consideration of the rejection to claim 2 in light of Applicants' previous assertion and analysis as to why the base claim 1 is allowable.

Regardless, Applicants assert that rejections to claim 2 is improper here because none of the four references in combination nor individually teach nor suggest the claimed features in claim 2, which includes, inter alia, "removing the organic materials from the inner surface of the faceplate panel by volatilizing the organic materials through heating such that volume rates of gaseous decomposition products from each of the components is less than diffusion rates of the respective gaseous decomposition products through the metal layer." Regardless, it is not clear why someone with knowledge of '952 and '092 would consider the teachings in '055 with '952 to come up with an EPS screen to obtain a composite organic screen weight in excess of 1.0 mg/cm^2. EPS screening taught in '952 involves screen components that are different chemically and functionally than in '055, i.e. EPS involves the use of an organic conductor layer and an organic photoconductive layer which are used to facilitate dry

phosphor deposition, and, as such must have screen weights optimized for the purpose of printing good phosphor lines. On the other hand, '055 teaches the use of materials that are used to print phosphor lines using a photoresist process. Because the printing technologies involved in '055 and '952 are completely different it is irrevelant to suggest that just because '952 has a screen weight that may be above a certain value that the screen weight for an EPS screen must or would be the same.

Further, regarding the assertion that "taking the references ('330 and '952) as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used about 0.6 mg/cm^2 of organic material of the photoconductive material (in '330) and up to 0.47 mg/cm^2 of organic material within the phosphor layer (in '055)." This combination is totally impermissible, because if one is using the photoconductive material in '330 to print phosphor lines, there is no need to include an additional 0.47 mg/cm^2 of organic material in the phosphor coating. The alleged "0.47 mg/cm^2" of organic material in the phosphor coating in '055 is only present to facilitate the photoresist printing of the phosphor lines. On the other hand, in EPS (electrophotographic screening), the phosphor particles are deposited as a dry powder with very little coating and the phosphor particles are then later fixed in a fixing step which effectively uses the already deposited organic photoconductor layer to achieve the fixing (see claim 3 in '952). As such, the combination of '330 and '952 to come up with screen weight value in excess of 1.0 mg/cm^2 is not proper.

Item 6:

Claim 3-4

Claims 3-4 stand rejected as being obvious in light of Giancaterini (U.S. Pat. No. 4,590,092) in view of Datta et al. (U.S. Pat. No. 5,370,952) and in further view of Patel et al. (U.S. Pat. No. 5,145,511).

Applicants first note that claims 3-4 depend from claim 1. As such, Applicants request reconsideration of the rejection to claims 3-4 in light of Applicants' previous assertion and analysis as to why the base claim 1 is allowable.

Applicants further disagree with the rejections to claims 3 and 4 in light of the fact that '511 does not suggest in anyway that aluminum blistering is curtailed because the heating rates are tailored such that the rate of the diffusion is greater than the volume rate of gaseous species evolution. Rather the proclaimed effectiveness of the process taught in '511 (col. 2, line 68 – col. 3, line 8) is that:

> "the aqueous filming emulsion of the present invention has a lower concentration of organic materials than most prior aqueous filming emulsions and the panel sealing step includes a sealing cycle which incorporates a rate of temperature increase, through at least a portion of the cycle, sufficient to volatilize the film, formed during a prior step, without the introduction of additional oxygen into the bulb."

In other words, the effective combination of screen baking and frit seal is due to less organic material as compared to conventional processing as shown in Table 1 in '511. As such, one skilled in the art with knowledge of '092 and '952 would consider first trying to implement the filming process in '511 (i.e. less organic content screen weight and lower "concentration of organic materials") into the concepts taught in '092 and '952, because that is what '511 teaches. Further, one skilled in the art with knowledge of '092 would look to coupling the improvements to microcrystal technology taught therein (i.e. improved microcrystal materials and treatment in claim 1).

Claim 5-6, 11

Claims 5-6 and 11 stand rejected as being obvious in light of Giancaterini (U.S. Pat. No. 4,590,092) in view of Datta et al. (U.S. Pat. No. 5,370,952) and in further view of Patel et al. (U.S. Pat. No. 5,145,511).

Applicants disagree with the rejections to claims 5, 6 and 11 in light of the fact that '511 does not suggest that aluminum blistering is curtailed by choosing heating rates tailored such that the rate of the diffusion is greater than the volume rate of gaseous species evolution. Rather the proclaimed effectiveness of the process taught in '511 (col. 2, line 68 – col. 3, line 8) which combines screen baking and frit seal is that less organic material is used compared to conventional processing as shown in Table 1 in '511. As such, one skilled in the art with knowledge of '092 and '952 would consider first trying to implement the filming process in '511 (i.e. less organic content screen weight and lower "concentration of organic materials") into the concepts taught in '092 and '952, because that is what '511 teaches. Further, one skilled in the art with knowledge of '092 would look to couple the improvements to microcrystal technology taught therein (i.e. improved microcrystal materials and treatment in claim 1), because that is what '092 teaches.

Claim 11:

Applicants also assert that the rejection of claim 11 is improper. In the Office Action, it is suggested that because (1) '092 mentions heating "higher than 350 °C to volatilize the organic components (col. 3, lines 14-17)" and (2) that the various screen component must have individual beginning decomposition temperature, claim 11 is invalid. The cited references do not teach in combination nor individually the use of a plurality of temperature rate increases for each of the components, where the rates each create gaseous decomposition products at volume rates less than diffusion rates.

Item 7:

Claim 6-10

Claims 6-10 stand rejected as being obvious in light of Giancaterini (U.S. Pat. No. 4,590,092) in view of Datta et al. (U.S. Pat. No. 5,370,952) and in further view of Patel et al. (U.S. Pat. No. 5,145,511).

Applicants first note that claims 6-10 depend from claim 1. As such, Applicants request consideration of the rejection to claims 6-10 in light of Applicants' previous assertion and analysis as to why the base claim 1 is allowable.

To support the rejection for claims 6-8, the teachings in Skinner (U.S. Pat. No. 4,154,494) can be combined with the numerous other references (Datta et al., Giancaterini, and Patel et al.). Applicants must emphasis that Skinner et al. does not teach nor suggest the application of on oxygen-evolving agent for screens with electrophotographic screens. Next, the principal object of Skinner et al. is to improve "the combined bake and seal process which avoids chemical reduction of the solder glass and thus produces a seal which is resistant to dielectric breakdown and hermetic failure." (col. 1, lines 62-66) However, Datta et al. makes no reference to problem associate with a combined bake and seal process to warrant consideration of oxidizing agents in CRTs with electrophotographic screening. Further, Giancaterini, and Patel et al. make no reference to CRTs with electrophotographic screening. As such, Applicants assert that there is no suggestion to combine the teaching of Datta et al. with the other asserted references to make claims 6-8 obvious.

In response to the comments about claims 9 and 10 in which it was asserted that "the discovery of optimum value of a result effective variable in a known process is ordinarily within the skill in the art," Applicants point out that the values are not a discovery of optimum values in a known process. In other words, the values are not

what was determined by trial and error of various decomposition rates of CRTs panels and seeing what conditions yield a best result. Rather the values are those determined from the teachings of the invention, which is to determine and analyze volume rates of gaseous decomposition products for each of the components, followed by tailoring a unique thermal cycle to effectively baking each of the components. As such, Applicants assert that these rates in claims 9 and 10 do not represent a discovery process as suggested.

Item 8:

Claim 12-16:

Claims 12-16 stand rejected as being obvious in light of Giancaterini (U.S. Pat. No. 4,590,092) in view of Datta et al. (U.S. Pat. No. 5,370,952) and Patel et al. (5,145,511) and in further view of Wagland (U.S. Pat. No. 5,776,555).

Applicants first point out that each of these claims depends on claim 11. As such, Applicants request consideration of the rejection to claims 12-16 in light of Applicants' previous assertion and analysis as to why the base claim 11 is allowable.

Regardless, Applicants point out that it is admitted in the office action that neither Patel et al., Datta et al. nor Giancaterini teach the 2nd through 5th temperature ranges of Applicants' claim 12. Wagland et al. also does not teach such temperature ranges. Applicants asserts that since none of these reference teach these features of 2nd through 5th temperature ranges, these features cannot be obvious and claim 12 is not obvious. As such, reconsideration of the rejection to claim 12 is requested.

Regarding the remaining claims, it is reasoned that because Wagland et al. teaches that PMMA (which appears in Applicants' claims 13-15) and PHEM (which appears in Applicants' claims 14-16) are operative decomposable materials for smoothing a phosphor layer prior to aluminizing, it would have been obvious to one of

ordinary skill in the art at the time the invention was made to incorporate PMMA and PHEM into the coating of Giancaterini and Patel with a reasonable expectation of success. Applicants', however, point out that there is no mention at all in Wagland et al., Patel et al. and Giancaterini of the subject matter therein being applicable to CRTs with electrophotographic screens such as that in Datta et al. Wagland specifically only pertains to screens with phosphor screens applied by the photoresist process. (See col. 4, lines 22-34 in Wagland which provides specific language that is only applicable to photoresist-type phosphors screens and not to electrophographically applied phosphor screens.)

Further, the cited references do not teach in combination nor individually the use of a plurality of temperature rate increases for each of the components, where the rates of each creates gaseous decomposition products at volume rates less than diffusion rates.

Therefore, because there is no suggestion in Wagland et al., Patel et al. and Giancaterini to use electrophotographic screens, there is no motivation to combine PMMA and PHEM with Datta et al. and because none of the cited references teach the feature of having gaseous decomposition products at volume rates less than diffusion rates, the rejections to claims 13-16 are improper.

Applicants respectfully assert that each of the claims now contains subject matter not considered during the prior rejections. Applicants assert that the cited references neither individually nor collectively anticipates nor makes obvious Applicants' claims.

As such, Applicants request reconsideration of each of the claims. If the Examiner has any question that would facilitate the resolution of the issues, he is respectfully requested to contact the undersigned at 717-295-6207.

Please charge extension fees for one month to Deposit Order Account No. 07-0832. Please also charge any additional fees associated with this application to Deposit Order Account No. 07-0832.

Respectfully submitted,

LaPeruta, Jr. et al., Applicants

Richard LaPeruta, Jr.
Registration No. 51,252
Attorney for Applicants
Phone: 717-295-6207
Facsimile: 609-734-6888

Patent Operation
Thomson Licensing Inc.
P.O. Box 5312
Princeton, NJ 08543-5312

August 16, 2005